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A new species and genus of aeolid nudibranch (Mollusca, Gastropoda) from the Iberian coasts

by José Carlos GARCIA-GOMEZ and Juan Lucas CERVERA

Abstract. — Two specimens of a new species of aeolid nudibranch from Southern Portugal, *Algarvia alba* n. sp., are described. This species is placed in the new genus *Algarvia*, within the Facelinidae. *Algarvia* n. gen. differs from members of the closely allied genera according to a set of morphological features, of which the more remarkable are the following : head with an enlargement on each side, rhinophores with some lamellae (they can be interrupted in front and/or behind the rhinophoral axis), nephroproct and gonopore interhepatic, masticatory border of jaws smooth, penis simple and unarmed. We add a comparative table among the new genus and other closely allied genera.

Résumé. — Nous décrivons une espèce nouvelle de nudibranche éolidien du sud du Portugal, *Algarvia alba* n. sp., à partir de deux exemplaires. La nouvelle espèce est placée dans le nouveau genre *Algarvia*, inclus dans les Facelinidae. *Algarvia* n. gen. est distinct des autres genres de la famille par plusieurs caractéristiques morphologiques dont les plus remarquables sont : tête élargie de chaque côté, rhinophores ayant quelques lamelles (qui peuvent être interrompues devant et/ou derrière l'axe du rhinophore), néphroprocte et gonopores interhépatiques, bord masticatoire des mâchoires lisse, pénis simple et inerme. Un tableau comparatif du nouveau genre avec d'autres genres étroitement liés est donné.

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INTRODUCTION

In an earlier paper (GARCIA-GOMEZ *et al.*, in press, *a*), a check-list of the opistobranch molluscs collected and identified during the international Marine Biological Expedition "Algarve-88" (May-June, 1988) (organized by the MNHN of Paris, Dr. P. BOUCHET, and the INIP of Portugal, Dr. L. SALDANHA) was furnished. New data on the results of this expedition were given in another recent paper (GARCIA-GOMEZ *et al.*, in press, *b*) that was partially done with material of the mentioned expedition.

In this paper, two specimens of an unknown species of aeolid nudibranch collected during the "Algarve-88" expedition are described and their systematic placement within the Aeolidacea is discussed.

Abbreviations

a, anus; am, ampulla; ce, cephalic enlargements; dd, deferent duct; fgl, female gland; gp, genital pore; hd, hermaphroditic duct; hw, hyaline white; m, mouth; ne, neophroproct; or, orange red; ow, opaque white; p, penis; pr, prostate.

Order NUDIBRANCHIA Cuvier, 1817

Family FACELINIDAE Bergh, 1889

ALGARVIA n. gen.

DIAGNOSIS : Body elongate, with a cephalic enlargement on each side, limaciform. Foot corners tentacular. Rhinophores with some lamellae; they can be interrupted in front and/or behind the rhinophoral axis. Cerata arranged in single oblique rows. Anus cleioproctic. Nephroproct and gonopore interhepatic. Masticatory border of jaws smooth. Radula uniseriate with cuspidate rachidian teeth. Central cusp of rachidian wide, with triangular adjacent denticles. Penis simple and unarmed.

TYPE SPECIES : *Algarvia alba* n. sp.

ETYMOLOGY : The name *Algarvia* is dedicated to the region of Algarve (Southern Portugal), along whose coasts the "Algarve-88" expedition occurred.

Algarvia alba n. sp.

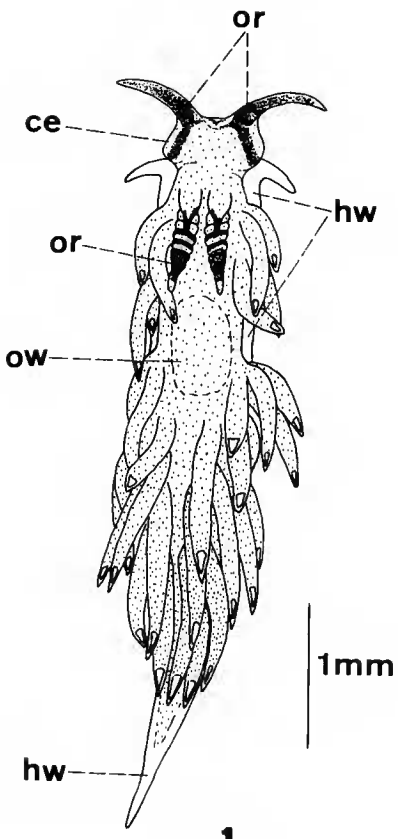
MATERIAL : Sagres (Southern Portugal) Baia da Baleeira, entrance to the harbour, bottom with rocks and ooze, 13 m (37°00' N; 08°55' W) : one specimen of 5 mm in length (21 May 1988); one specimen of 2'5 mm (24 May 1988).

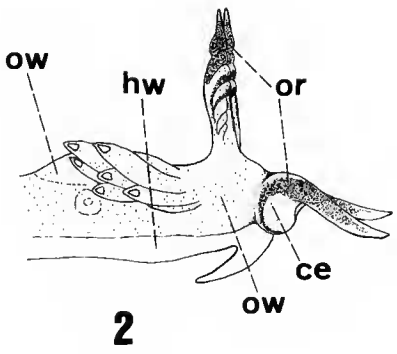
EXTERNAL ANATOMY (figs 1-6)

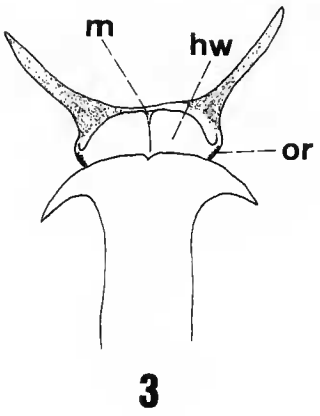
The body is elongate and has a very conspicuous enlargement on each side of the head, in front of the rhinophores. These enlargements form a small recess that corresponds to the space between the bases of the oral tentacles. The foot is slightly wider than the body, has a small notch anteriorly and tapers posteriorly to a pointed tail. The rhinophores have 5 oblique lamellae arched posteriorly. The two upper lamellae are interrupted behind and the three remaining ones are interrupted in front and behind, being different in size. The rhinophores have a swelling over the upper lamella (figs. 1, 2, 4, 6). The oral tentacles are elongate, starting from the cephalic enlargements. The foot corners are tentacular, about 2/3 of the length of the oral tentacles. The cerata are arranged in single oblique rows (fig. 6). The ceratal formula in the specimen of 5 mm was I-5, II-4 (anterior ceratal cluster), III-3-4, IV-3, V-3, VI-3, VII-2, VIII-1-2. The longest cerata are more dorsal and longer than the rhinophores and the oral tentacles. The anus is cleioproctic (fig. 6), located behind the lower ceras of the first post-pericardial row. The nephroproct is situated between the second and third ceratal rows, within the interhepatic space. The gonopore is also located within the interhepatic space on the right side of the body, at the pericardial level.

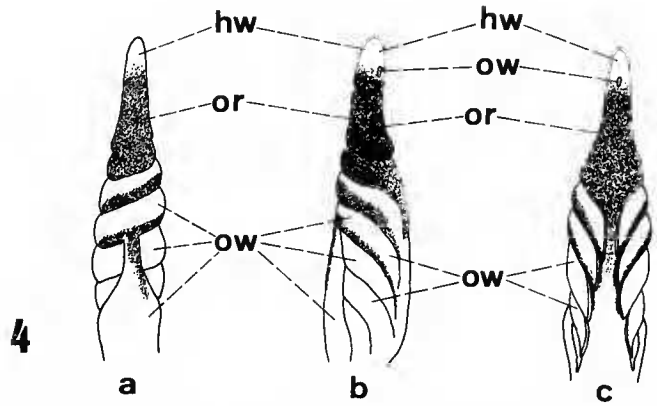
COLORATION (figs 1-5)

The ground color is hyaline white with opaque white pigment that covers the whole of the animal except the foot, the tips of cerata, rhinophores and oral tentacles. Orange red









FIGS 1-4. — *Algarvia alba* n. gen., n. sp. : 1, dorsal view; 2, lateral view of the anterior part; 3, ventral view of the anterior part; 4, anterior (a), inner left (b) and posterior (c) views of a rhinophore.

pigmentation covers most of the dorsal surface of the oral tentacles and a large portion of the surface of the cephalic enlargements. This pigment is also present on the apical part of the rhinophores, except at their tips, as well as on part of the two upper rhinophoral lamellae and part of the anterior rhinophoral face.

INTERNAL ANATOMY (figs 7-9)

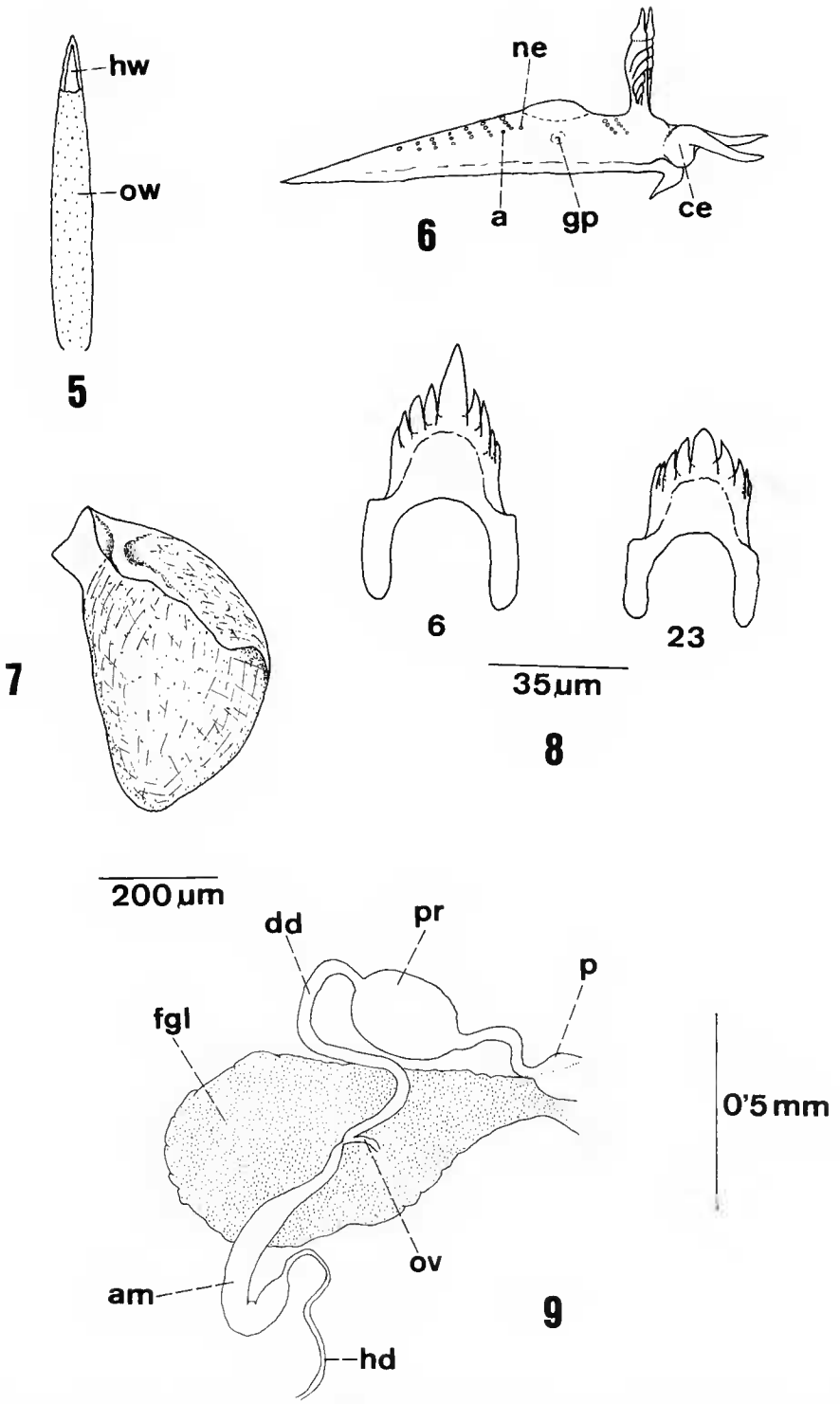
The jaws are gold in color and concave, with a short and smooth masticatory border. Their shape is depicted in figure 7. The radular formula of the specimen of 5 mm is 23 × 0.1.0. The radular teeth (fig. 8) are thin are elongate. On the either side of the prominent triangular central cusp are 4 triangular denticles, but from 15th tooth up to the last, the central cusp becomes shorter. The reproductive system (fig. 9) has a hermaphroditic duct that widens in an elongate ampulla, which bends at the proximal end. The relatively long vas deferens forms an almost spherical prostate joining the penis, which is simple and unarmed. The location of the seminal receptacle was not observed, probably due to its internal position within the female gland and also to the small size of the specimen.

ETYMOLOGY : The specific name *alba* refers to the opaque white pigmentation covering almost the whole of the animals of this species.

HOLOTYPE : The specimen of 2,5 mm in length was designated as holotype, being deposited in the collections of the Muséum national d'Histoire naturelle, Paris.

DISCUSSION

Facelinid taxonomy fell into two schools of thought twenty years ago. One recognized the genera on the basis of the mode of branching of the liver and the arrangement of cerata that results from it. Thus, the two major groups should be composed by the species in which the anterior liver gives off cerata in rows (subfamily Facelininae or family Facelinidae) and the species in which the anterior liver gives off cerata in arches (subfamily Favorininae or family Favorinidae) (MARCUS, 1958; MILLER, 1974; RUDMAN, 1980). The other trend was that of the EDMUNDS (1970), who stated that reproductive characters, particularly the development of the seminal receptacle and the gametolytic gland (quoted by this author as bursa copulatrix), should take taxonomic precedence over ceratal arrangement, and that ceratal arrangement should be considered polyphyletic. EDMUNDS argued that the Favorinidae and Facelinidae are polyphyletic and that separation of the two families on the basis branching of the digestive system does not accurately reflect evolution within the groups. According to GOSLINER (1980), MILLER's (1974) placement of the families Favorininae, Cratenidae, Facelinidae and Hervelliidae as subfamilies within Glaucidae does not solve the problem, because these are still polyphyletic units established on the basis of convergence in ceratal arrangement. According to GOSLINER (1980), establishment of phyletic units on the basis of reproductive system seems more accurate and decreases the number of polyphyletic taxa. Thus, this author discarded the subfamilies proposed by MILLER (1974) and retained the species in a single large family, the Facelinidae, and maintained the genera *Glaucus* Foster, 1777, and *Pteraeolidia* Bergh, 1875, in Glaucidae and Pteraeolididae, respectively. This opinion was followed by SCHMEKEL and



FIGS 5-9. — *Algarvia alba* n. gen., n. sp. : 5, detail of a ceras; 6, schematic arrangement of cerata; 7, jaw; 8, sixth and twenty-third radular teeth; 9, reproductives system.

PORTMANN (1982), EDMUNDS and JUST (1983), JUST and EDMUNDS (1985), CERVERA *et al.* (1988), and GARCIA-GOMEZ *et al.* (1989). THOMPSON and BROWN (1984), CATTANEO and BARLETTA (1984), PLATTS (1985) and CATTANEO-VIETTI and THOMPSON (1989) retained the division between Facelinidae and Favorinidae at the family level. GOSLINER and BEHRENS (1986) used the Favorininae taxon within Facelinidae and GOSLINER (1987) included *Cratena* Bergh, 1864 within the family Cratenidae.

EDMUNDS and JUST (1983) recognized that the numerous genera of facelinids are not all defined in the best way to reflect phyletic relationships, but they nevertheless prefer, as we do, to follow GOSLINER (1980) rather than MILLER (1974) or RUDMAN (1980) and retain all genera that MILLER placed *Phidiana* Gray, 1850, sensu lato, so that these genera should be considered as distinct genera until more accurate relationships can be assessed. WILLAN (1987*a*) first followed GOSLINER (1980), discarding the subfamilies proposed by MILLER (1974), but later (WILLAN, 1987*b*) used the genus *Phidiana* sensu lato to describe *P. pegasus*, following MILLER's proposal.

Our specimens are clearly placed in the Facelinidae sensu GOSLINER (1980), as the anus is cleioproctic, the nephroproct is interhepatic and the uniseriate radula bears cuspidate teeth. However, we have not found any genus in such family in which our animals could be included. Thus, we think that the proposal of the new genus *Algarvia* needs to be justified and compared with the criteria followed for other species of aeolidacens in earlier papers (GARCIA-GOMEZ, 1984; CERVERA and GARCIA, 1986; CERVERA *et al.*, 1988; GARCIA-GOMEZ and CERVERA, 1989; GARCIA-GOMEZ and THOMPSON, in press). Thus, in the description of the flabellinid *Flabellina baetica* García-Gómez, 1984, the possible placement of this species within a new genus was discussed making reference to the presence of papillate rhinophores. However, since the other external and internal characters were those of the genus *Flabellina* Voigt, 1834, and according to the criteria of GOSLINER and GRIFFITHS (1981), the proposal of a new genus was considered unnecessary (GARCIA-GOMEZ, 1984). Likewise, following RUDMAN (1982), we have considered the aeolidid genus *Berghia* Trinchese, 1876-77 as synonymous with *Spurilla* Bergh, 1864, since the only difference between both genera is the shape of the rhinophores (CERVERA and GARCIA, 1986; CERVERA *et al.*, 1988; GARCIA-GOMEZ and THOMPSON, in press). Another problem was raised by the accurate generic placement of *Flabellina insolita* García-Gómez & Cervera, 1989, as this species had internal characters (jaws, radula, reproductive system) typical of the genus *Flabellina*, while it showed external features clearly unusual among the aeolidaceans : rhinophores and oral tentacles enlarged at the base and small papillae flanking the pericardial area. Faced with the possibility of proposing a new genus, we decided to give more taxonomical value to the internal characters, the location of the anus and nephroproct, and the ceratal arrangement, so that we retained the species *F. insolita* within *Flabellina* (GARCIA-GOMEZ and CERVERA, 1989).

In our view, the case of *Algarvia* is also different. Although the internal characters of this genus do not differ clearly from those of other genera of the family, we have not been able to place our specimens in any known genus of Facelinidae taking into consideration jointly internal and external (especially the location of the anus and nephroproct, ceratal arrangement and cephalic enlargements) characters. Therefore, we think the whole of external characters together with the presence of a smooth mandibular masticatory border are sufficient to propose this new genus, which is compared in Table I with all facelinid genera that have only a seminal receptacle and the anterior ceratal cluster arranged in rows (genera of the subfamily

TABLE I. — Comparison of *Algarvia* with those facelinid genera that has only a seminal receptacle and the anterior ceratal cluster arranged in rows.

GENERA	CEPHALIC ENLARGEMENTS	RHINOPHORES	ANTERIOR CERATAL CLUSTER	POSTERIOR CERATAL CLUSTER	FOOT CORNERS	MASTICATORY BORDER	GENITAL PORE	NEPHTOPROCT	PENIS
Phidiana Gray, 1850	—	Smooth, exceptionally with some rings	Rows	Rows	Rounded	Denticulate	Prepericardial or interhepatic	Interhepatic	With a terminal hollow spine
Facelina Alder and Hancock, 1855	—	Lamellate, exceptionally tuberculate or smooth	Rows, rarely with an arch	Rows and arches	Tentacular	Denticulate	Prepericardial	Interheparic	With spines (rarely absent) often with penial gland
Hermissenda Bergh, 1879	—	Perfoliate	Rows	Rows	Tentacular	Denticulate	Prepericardial	Interhepatic	Papillate
Caloria Trinchese, 1888	—	Papillate or smooth	Rows	Row	Tentacular	Denticulate	Prepericardial	Interhepatic	Simple, unarmed
Moridilla Bergh, 1888	—	Smooth, papillate or lamellate	Rows	Rows	Tentacular	Denticulate	Prepericardial	Interhepatic	Simple, unarmed
Facelinella Baba, 1949	—	Lamellate or smooth	Rows	Rows	Tentacular	Denticulate	Prepericardial	Postpericardial	With spines
Rolandia, Pruvot-Fol, 1951	—	Lamellate or annulate	Rows	Rows	Tentacular	Denticulate	Prepericardial	?	Unarmed, with accesory penial leaf
Facelinopsis Pruvot-Fol, 1954	—	Some lamellae	Rows	Rows, exceptionally some arch	Rounded	Denticulate	Interhepatic	?	Unarmed, with accesory penial leaf
Palisa Edmunds, 1964	—	Papillate	Rows	Arches and rows	Tentacular	Slightly denticulate	Interhepatic	?	Simple, unarmed
Pruvotfolia Tardy, 1969	—	Perfoliate	Rows	Rows	Tentacular	Denticulate	Interhepatic	Interhepatic	With spines
Emarcusia Roller, 1972	—	Smooth	Rows	Rows	Rounded	Denticulate	Prepericardial	?	With a tubular stylet
Learchis Bergh, 1896	—	Smooth or annunulate	Rows	Rows or arches	Tentacular	Denticulate	Prepericardial	Interhepatic	Unarmed
Algarvia n. gen.	+	Some lamellae (they can be interrupted in front and/or behind	Rows	Rows	Tentacular	Smooth	Interhepatic	Interhepatic	Simple, unarmed

Facelininae, according to MILLER, 1974), except *Antonietta* Schmekel, 1966, which also has gametolytic gland. From this Table, we can infer that *Algarvia* is the only one of the compared genera that possesses smooth mandibular masticatory border. Other facelinid genera with smooth mandibular masticatory border are *Antonietta* Schmekel, 1966, *Dicata* Schmekel, 1967, *Hermosita* Gosliner & Behrens, 1986, *Phyllodesmopsis* Risso-Domínguez, 1964, and *Jason* Miller, 1974, but the three former possess gametolytic gland, and, except *Antonietta*, the remaining genera have the anterior ceratal cluster arranged in arches. On the other hand, *Jason* has a vestigial radula. Moreover, the cephalic enlargement on each side of the head is a character unknown in any other aeolidacean.

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